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Applicant ODDSEN, Odd, Geir et al	

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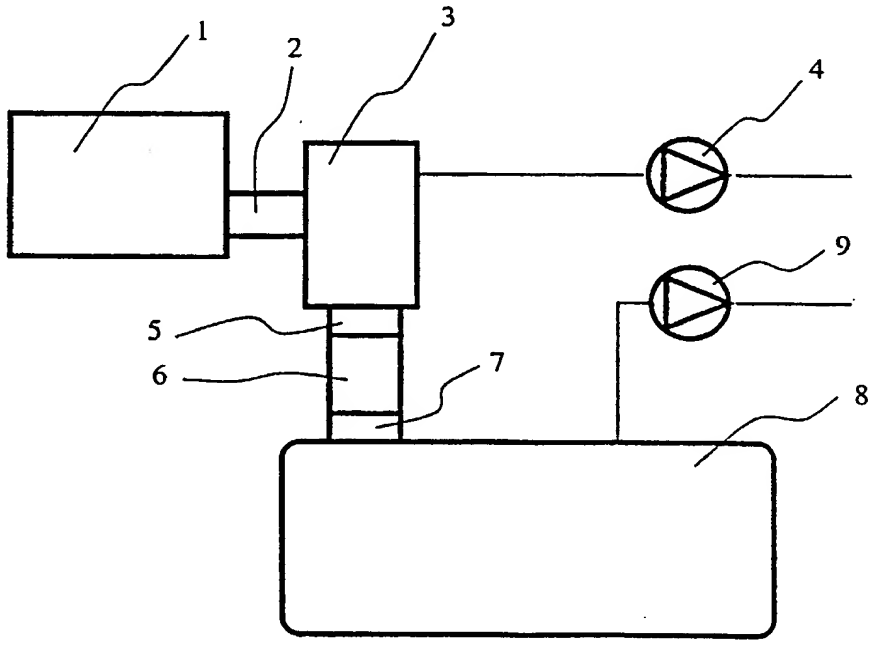
(54) Title: A METHOD OF MANUFACTURING FEED PELLETS AND PLANT FOR USE IN THE IMPLEMENTATION OF THE METHOD

(57) Abstract

A method of manufacturing feed pellets, and a plant for the implementation of this method have been explained. The aim has been to improve the manufacturing of porous pellets, first and foremost to achieve a better control of the porosity than by known technique. The pellets come from a pelletizing machine (1) into a pellet chamber (3) which is kept at a pressure lower than the ambient pressure. From the chamber (3) the pellets are passed through an outlet (5) having a gate lock body (6).



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C L A I M S

1. A method of manufacturing feed pellets, c h a r a c - t e r i z e d i n that pellets are produced by, discharged by or extruded by a pressure which is lower than the ambient pressure, and that pellets, after a relatively short stay at said reduced pressure, are transferred to a drying process.

2. A method as claimed in claim 1, c h a r a c t e r i z e d i n that the pellets are subjected to the reduced pressure for a period of time in the order of from a few seconds up to about 1 minute.

3. A method as claimed in claim 1, c h a r a c t e r i z e d i n that the subsequent drying process is carried through at a reduced pressure relative to that of the surroundings.

4. A method as claimed in claim 3, c h a r a c t e r i z e d i n that the subsequent drying process is also carried through at a temperature lower than 100 °C.

5. A method as claimed in any one of the preceding claims, c h a r a c t e r i z e d i n that the drying process is carried through in an oil bath which also works as a deep-frying treatment.

6. A method as claimed in the preceding claims 1 and 3, c h a r a c t e r i z e d i n that the pelletizing or the immediately following after-treatment is carried through by a first reduced pressure, whereas the

following drying process is carried through by a second reduced pressure.

7. A method as claimed in claim 6, characterized in that said first pressure corresponds to said second pressure.

8. A method as claimed in claim 6, characterized in that said first pressure is different from said second pressure.

9. A plant for use in the implementation of the method claimed in claim 1, comprising a pellet chamber (3), preferably interconnected in the plant downstream of a pelletizing machine (1), an extruding device for pellets or similar, characterized in that the pellet chamber (3) is arranged to be kept at a pressure lower than the ambient pressure, for example in the order of 100 - 800 millibar.

10. A plant as claimed in claim 9, comprising a tank (8) with oil, which forms a deep-frying container, characterized in that said pellet chamber (3) has an outlet (5) which opens, directly or indirectly, into said oil tank (8), which is also arranged to be kept at a pressure lower than the ambient pressure, for example in the order of 100 - 800 millibar.

11. A plant as claimed in claim 10, characterized in that between the pellet chamber (3) and the oil tank (8) there is arranged a gate lock body (6).

12. A plant as claimed in claim 11, characterized in that the gate lock body (6) is arranged to be able to rotate, with the aim of allowing a continuous feeding out of pellets from the pellet chamber (3).

13. A plant as claimed in claim 9, 10 or 11, characterized in that the pellet chamber (3) has a first vacuum pump (4) arranged thereto, which is arranged to maintain the air pressure inside the pellet chamber (3) at a first desired value, lower than that of the ambient pressure, and that the oil tank (8) has a second vacuum pump (9) arranged thereto, which is arranged to maintain the air pressure inside the oil tank (8) at a second desired value, which is lower than that of the ambient pressure, possibly also lower than said first value.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NO 00/00093

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A23K 1/00, A23K 1/18, A23N 17/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A23K, A23P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9816121 A1 (WENGER MANUFACTURING, INC.), 23 April 1998 (23.04.98), abstract; claims 1 and 12	1-13
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X	NO 991081 A (NISSHIN FLOUR MILLING CO., LTD.), 4 March 1999 (04.03.99)	1-13
	--	
X	WO 9803080 A1 (BÜHLER AG), 29 January 1998 (29.01.98), abstract; claim 1	1-13
	--	
X	Patent Abstracts of Japan, abstract of JP 21-38944 A (Nisshin flour milling co ltd), 28 May 1990 (28.05.90)	1-13
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Date of the actual completion of the international search	Date of mailing of the international search report
5 July 2000	20 -07- 2000
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INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	File WPI, Derwent accession no. 1997-409865, FACIFIC SCI KK: "Adsorbing oils and fats to feed pellets for fish - comprises mixing pellets and oils and fats under reduced pressure and returning to atmospheric pressure"; & JP,A,9182561, 19970715 DW199738	1-13

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INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9816121 A1	23/04/98	AU 4602297 A	11/05/98
		EP 0942659 A	22/09/99
		NO 991795 A	02/06/99
		US 5783240 A	21/07/98
NO 991081 A	04/03/99	EP 0927522 A	07/07/99
		WO 9809542 A	12/03/98
WO 9803080 A1	29/01/98	EP 0915664 A	19/05/99